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RESEARCH ARTICLE

New records of water scavenger beetles *Berosus geminus* Reiche & Saulcy, 1856 (Coleoptera: Hydrophilidae) from Russia

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Abstract

The species *Berosus geminus* Reiche & Saulcy, 1856 (Hydrophilidae) is recorded for the first time for European part of Russia. A map with the general distribution of this species is provided.

Keywords

Berosus, Coleoptera, Hydrophilidae, new records, Russia

Introduction

Berosus Leach, 1817 is one of the largest genus of water scavenger beetles of the family Hydrophilidae (Hydrophilinae, Berosini), with ~300 described species and worldwide distribution (Hansen 1999; Short and Fikáček 2011, 2013; Fikáček 2019; Santana et al. 2019). The genus is very characteristic by head with protruding eyes. Body (length 1.5–9.0 mm) narrowly to widely elongate, elytron in some species with subapical spine (subgenus *Enoplurus*); head constricted in front of eyes; labrum exposed, large; antenna with 7 antennomeres; abdomen with five visible ventrites; posterior margin of ventrite 5 usually with median emargination; male protarsi with

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4 tarsomeres only, some of which are slightly enlarged and with stiff setae ventrally; dorsal coloration usually reddish to yellowish with variable pattern of dark spots (Fikáček 2019).

All known species are aquatic, and generally good swimmers. They inhabit a range of "traditional" aquatic habitats, with most species occurring in lentic conditions such as ponds and marshes (Oliva and Short 2012), some species are characteristic for riverside pools of stony rivers or forest streams; larvae are adapted to benthic lifestyle (Fikáček 2019).

Three subgenera are recognised within *Berosus*: *Enoplurus* for species with elytra each bearing subapical spine, *Berosus* s. str. for species without such spine, and *Phelerosus* containing the New Zealand species (Fikáček 2019). In Europe, 13 species of the genus has been recorded from the following subgenera: *Berosus* s. str. and *Enoplurus* (Hansen, 1999; Przewoźny 2019). Currently, 9 species of *Berosus* are known from Russia (Litovkin 2019; Przewoźny 2019):

Berosus (s. str.) *luridus* Linnaeus, 1760 – NT, CT, ST (Ural), ES
Berosus (s. str.) *punctipennis* Harold, 1878 – FE
Berosus (s. str.) *signaticollis* (Charpentier, 1825) – CT, ST, WS, FE
Berosus (*Enoplurus*) *bispina* Reiche et Saulcy, 1856 – ST
Berosus (*Enoplurus*) *fischeri* Schoedl, 1993 – FE
Berosus (*Enoplurus*) *frontifoveatus* Kuwert, 1888 – CT, ST (Ural)
Berosus (*Enoplurus*) *fulvus* Kuwert, 1888 – ST, WS, ES
Berosus (*Enoplurus*) *lewisius* Sharp, 1873 – FE
Berosus (*Enoplurus*) *spinosus* (Steven, 1808) – CT, ST, WS, ES

Abbreviations: CT – Central European Territory, NT – North European Territory, ST – South European Territory, ES – East Siberia, WS – West Siberia, FE – Far East.

The species *Berosus* (s. str.) *geminus* Reiche & Saulcy, 1856, previously was known only from Europe (Central and Eastern Europe, Balkans). Later, this species was recorded from the south of Western Siberia (Tyumen Oblast) (Shatrovskiy 2017), but this record, unfortunately, was not included in the general list of Hydrophilidae of Russia by Litovkin (2019), nor in the newest version of the Catalogue of Palearctic Hydrophiloidea (Przewoźny 2019). Thus, the main objective of this study is to provide the first record of *B. geminus* for the European part of Russia.

Material and methods

Our new record of *B. geminus*, discussed herein, is based on material collected by the author in Yaroslavl Oblast in 2016. Two specimens of *Berosus geminus* were collected jointly with 15 specimens of *Laccobius* (s. str.) *minutus* (Linnaeus, 1758) using hand entomological net (semi-quantitative sample). Material was picked up in the field and conserved by 70% ethyl alcohol. For future investigation the specimens were preparated in dry conditions. Extracted genitalia were glued near the

male. Identification of beetles was performed in the laboratory using special literature (Schödl 1993). The material was identified by the author and confirmed by A.A. Prokin.

The material is deposited in the collection of the Papanin Institute for Biology of Inland Waters of the Russian Academy of Sciences (IBIW, Borok, Yaroslavl Region, Russia).

Photography was taken using an Olympus TG-5 digital camera and stereomicroscope MC-5-ZOOM LED with ToupCam 10.0 MP CMOS camera. Photography enhanced by using PhotoScape X 4.0.2. Map was created in SimpleMappr online service (www.simplemappr.net).

Taxonomy

Family Hydrophilidae Latreille, 1802

Genus *Berosus* Leach, 1817

***Berosus* (s. str.) *geminus* Reiche & Saulcy, 1856**
Fig. 1–2.

Material examined. RUSSIA • 1♂, 1♀; Yaroslavl Oblast, Nekouzsky distr., Borok vill. env., littoral of Shumarovka River; sand, 58°02'24"N, 38°15'04"E; 12 Apr. 2016; A.S. Sazhnev leg. (IBIW, Borok, Yaroslavl Region, Russia).

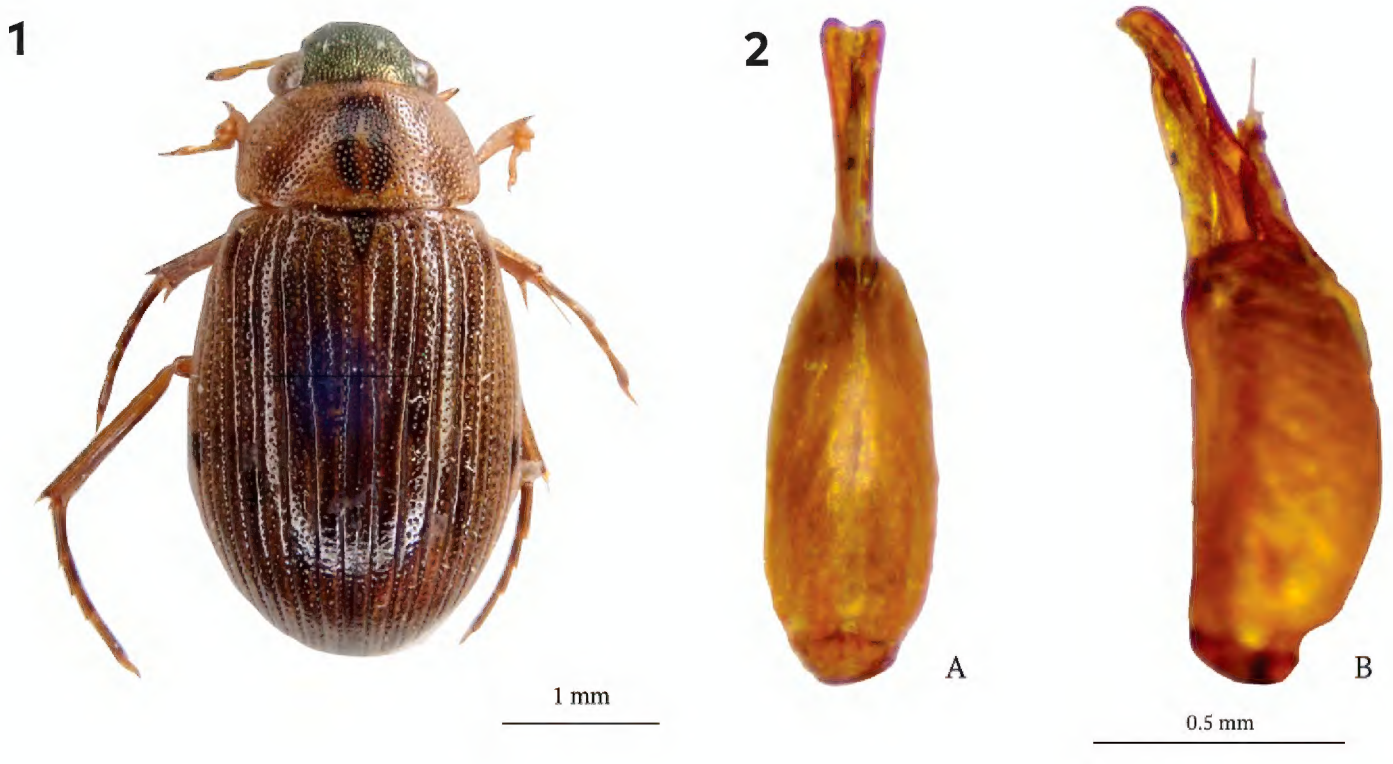

Figure 1–2. 1 Dorsal habitus of male *Berosus* (s. str.) *geminus* from Yaroslavl Oblast, Russia. **2** Aedagus. A – lateral view, B – side view.

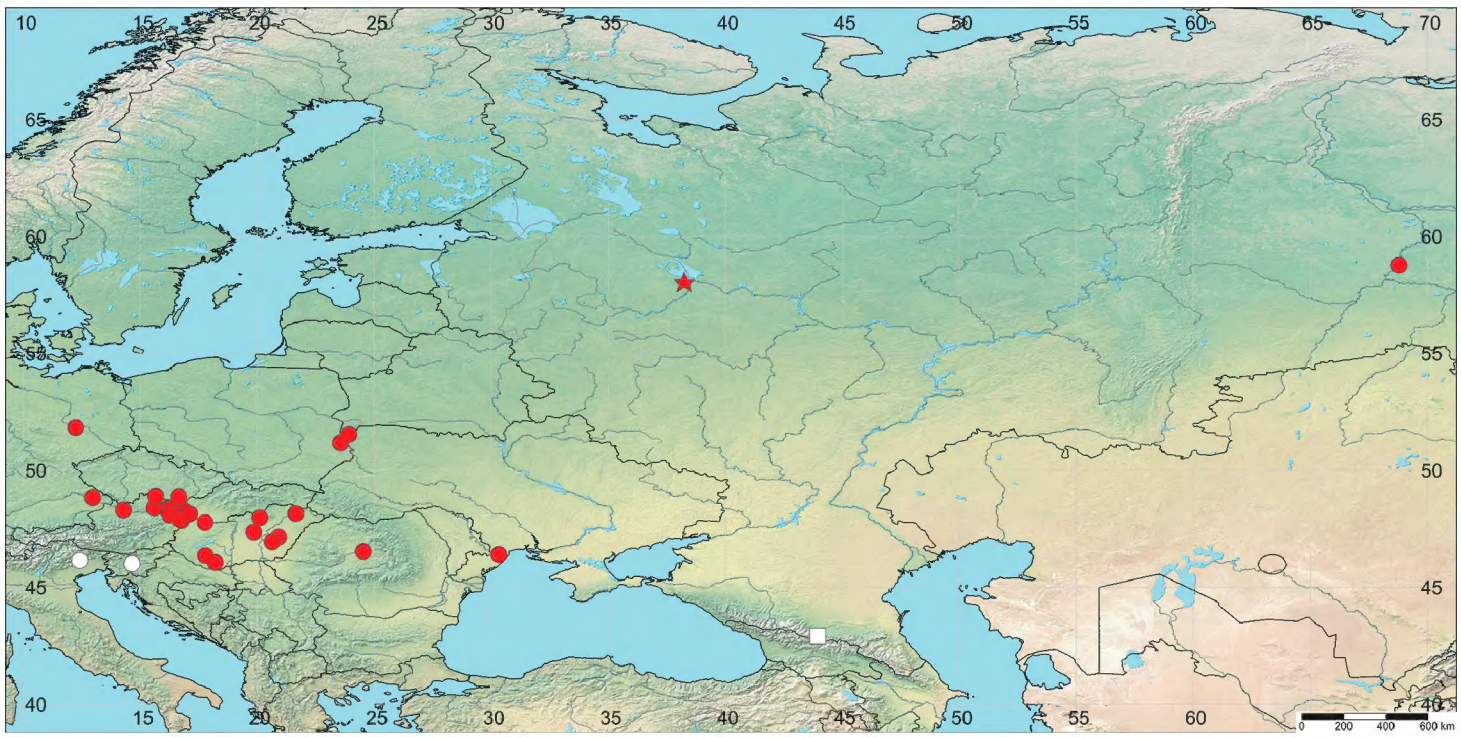

Figure 3. Distribution of *Berosus* (s. str.) *geminus*: red circles – localities from references; white circles – countries with a general recorded in the Catalogue of Palearctic Hydrophiloidea (without localities), white square – locus typicus «Caucasus», red star – new record.

Diagnosis. Body length 4.5–6 mm. Spots on pronotum in shape of narrow stripes (Fig. 1). First abdominal ventrite with small longitudinal keel on the base. Elytral apex rounded, without spine. Interval 4 of elytra with regular row of punctures, bigger punctures visible on elytra interval 3 only. At the sides of elytra – a clear and isolated spot (Fig. 1). Aedeagus as in Fig. 2

Known distribution. Austria, Croatia, Czech Republic, Germany, Hungary, Italy, Poland, Romania, Slovakia, Ukraine, «Caucasus», North European Territory of Russia (new, our record!) and West Siberia (Shatrovskiy 2017; Przewoźny 2019). As a result, a map of general distribution of this species is compiled using published data (Schödl 1993; Przewoźny and Buczyński 2008; Shatrovskiy and Kravchenko 2016; Shatrovskiy 2017) and our new record (Fig. 3).

Discussion

The species *B. geminus* have not been distinguished from closely related *B. signaticollis* (Charpentier, 1825) for a long time. Therefore, distribution of this almost unknown species has been reveled recently (Schödl 1993, Przewoźny and Buczyński 2008; Shatrovskiy 2017) and still poorly known. It is necessary to check the collection material of *Berosus* s. str., and especially *B. signaticollis*, for the detection of *B. geminus* in other regions of Russia and Palaearctic in general.

The range of this species reaches Caucasus where its locus typicus is situated (Schödl 1993). Known records of *B. geminus* from Germany (Saxony-Anhalt)

and Poland were considered to be on the northern border of its range in Europe (Przewoźny and Buczyński 2008). Our new record from Borok is 1200 km towards the north-east from German and Poland localities. Thus, the record of *B. geminus* from Yaroslavl Oblast is the most northern, and significanlly extends the known range of this species.

There are a few data on species habitat preferences. Klausnitzer (1996) regards B. geminus as acidophilous and detritophilous species. In Poland (Przewoźny and Buczyński 2008) and European Russia (this study) *B. geminus* was collected in a dystrophic water body. In Hungary this species prefers pools and floodings in the valleys of large rivers (Csabai 2005), in Czech Republic it is prefers lentic habitats (Travnicek et al. 1999). In Siberia *B. geminus* was recorded from the swampy shore of the lake in the valleys of Irtysh River with the dominance of mosses, sedges, club-rush and *Comarum palustre* (Shatrovskiy 2017).

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